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A NEW GENUS AND SPECIES OF CALIFORNIA PILL BEETLE (COLEOPTERA: BYRRHIDAE)

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During routine examination of various collections of Byrrhidae, a new species and genus was found in the miscellaneous material from the University of California, Davis. My thanks to R. O. Schuster for the loan of this material, and to Dr. L. K. Russell for checking the description.

This extremely interesting and unique byrrhid can be defined as follows:

Sierraclava, new genus

Type-species.—Sierraclava cooperi, new species.

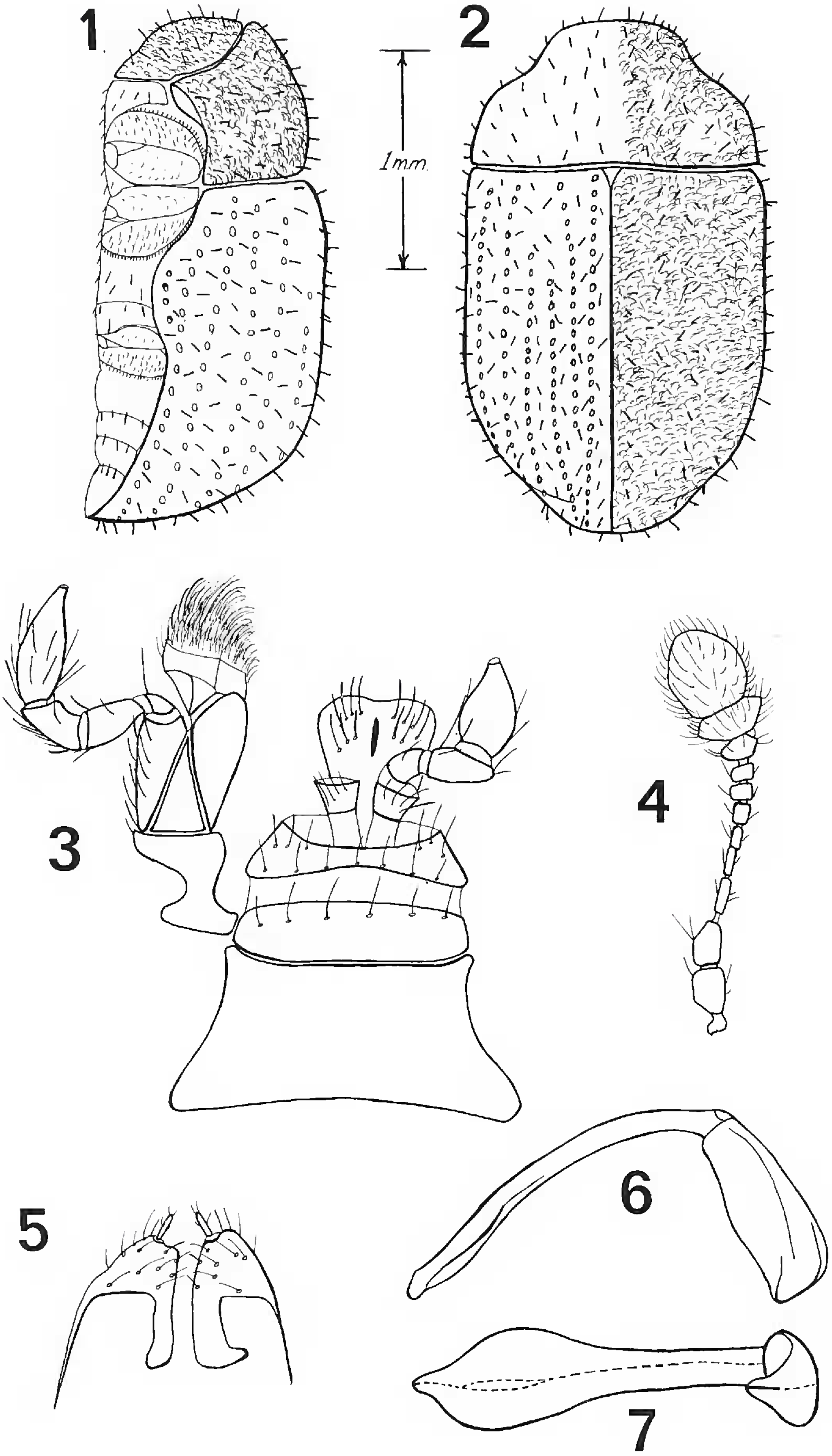
Elongate-oval, convex; basal two-thirds of elytral margins parallel; head entirely retractile, eyes and mouthparts not visible in repose; clypeus obsolete; mandibles stout, tridentate; maxillary palps 4-segmented; labial palps 3-segmented; galea fleshy and heavily setaceous; antennae capitate-clavate, scape and second article expanded, flagellum received into groove between prosternum and pronotal epipleura; prosternum Y-shaped with short prosternal process; proepisternum obsolete; mesosternum transversely narrow, deeply excavated medially, obsolescent; metasternum broader than long; abdomen longer than broad, five visible segments, apical segment not modified; pro- and metatrochanters spurred basally; pronotum strongly constricted anteriorly, convex, laterally with tear-drop shaped excavation near front angles, deeply concave epipleurae, basally subequal in width to elytra; scutellum obsolecent, triangular; elytra twice as long as pronotum, convex, deeply and serially punctate, bristle-like hairs arranged serially on interstrial spaces, smaller appressed hairs giving a mottled appearance throughout dorsum; entire venter modified for complete retraction of all appendages, punctate and clothed with short bristle-like hairs; leg segments individually modified for retraction of adjacent segments; tarsus essentially 4-4-4, first article minute and completely fused to second article; aedeagus single-lobed, spatulate, arcuate in lateral outline; female styli reduced, peg-like; length 2.0–2.6 mm.

Etymology.—Sierra- is in reference to the Sierra Nevada mountain range in which the type locality is located; *-clava* refers to the distinctive capitate-clavate antennae.

Sierraclava cooperi, new species
(Figs. 1–7)

Holotype male.—Form compact, elongate-oval, convex; basal two-thirds of elytral margins parallel; length 2.0–2.6 mm; integument testaceous to brown to piceous dorsally, testaceous to rufous ventrally; entire dorsum densely clothed with variegated patterns of brown and white, decumbent, scale-like setae; additionally sparsely to moderately clothed with straight, stout, slightly clavate, truncated, dark colored hairs, these being randomly distributed on head and pronotum, and serial on the interstrial spaces of elytra; venter sparsely to moderately clothed with bristle-like hairs directed posteriorly, arising from upon interpunctural spaces.

Head rounded, convex, completely retractile into pronotum, eyes not visible from front and mouthparts not visible when head retracted; frons densely, deeply punctate, punctures becoming smaller, less dense towards vertex, pubescence as above; frons becoming depressed anteriorly with broad, shallow impressions laterally above mandibular insertions; circumfrontal carina strong from vertex to eyes, becoming finer anteriorly where it may represent fronto-clypeal suture; space between anterior ''clypeal'' margin and ''clypeal suture'' densely, deeply punctate, this space and anterior clypeal margin deflexed inward from clypeal suture; entire frons moderately microreticulate, shining between reticulations. Eyes hemispherical, flattened, coarsely faceted, gray in color. Antennae as in Fig. 4, 11-segmented, capitate-clavate, not reaching base of pronotum, entire flagellum sparsely pubescent with short pale hairs, apical segments moderately pubescent; antennae received into grooves between prosternum and pronotum. Labrum small, twice as wide as long, one-eighth as wide as widest portion of frons; shallowly, sparsely punctate; shining; sparsely pubescent on disc, denser marginally; broadly, shallowly emarginate apically; anterior angles broadly rounded. Mandibles stout, 1.5 times longer than broad; tridentate; membranous and ciliated medially; notched medially with notch extending towards base; molar area chitinized, bluntly toothed; ventral condyle small. Ventral mouthparts as in Fig. 3; maxillary palps 4-segmented, ultimate segment narrowly pear-shaped, cylindrical, apex truncate and membranous; penultimate one-half length of ultimate; segment 2 subequal to penultimate; basal one-half length of segment 2. Galea fleshy, lobe-like, heavily setaceous apically. Lacinia similar to galea but shorter. Labial palps 3-segmented; utltimate segment broadly pear-shaped, cylindrical, apex truncate and membranous; penultimate subequal in length to ultimate; basal segment one-half length of penultimate. Ligula cordate, shallowly emarginate apically; membranous. Mentum subtrapezoidal, short, 5 times wider than long, broadly and shallowly emarginate anteriorly. Submentum quadrate, 4.5 times wider than long. Gula trapezoidal, twice as wide as long, sides sinuate anteriorly.



Figs. 1–7. *Sierraclava cooperi* Johnson, new genus, new species. Fig. 1, Adult, lateral view, elytral pubescence removed. Fig. 2. Adult, dorsal view, left side pubescence removed. Fig. 3. Ventral mouthparts, left labial palp and right maxillary palp removed. Fig. 4. Antenna. Fig. 5. Female genitalia. Fig. 6. Male genitalia, lateral view. Fig. 7. Male genitalia, ventral view.

Pronotum convex, trapezoidal, strongly constricted anteriorly, appearing broadly rounded in dorsal view; anterior angles obtuse, slightly deflexed and depressed inside of angle; lateral margin double in anterior half, enclosing a depression with beaded margins and widest at anterior angle; lateral margin beaded basally; hind angles subacute, depressed, right-angled; posterior margin finely beaded, depressed, slightly sinuate; integument shining, strongly microreticulate, impunctate; epipleura deeply excavated for reception of proleg, shining, finely microreticulate. Scutellum very small, smooth, triangular.

Elytra 2.5 times longer than and subequal in width to pronotum, slightly sinuate and depressed basally; integument strongly microreticulate, shining; 11-striate; striae composed of deep, serial punctures, often coalescing; subsulcate apically; striae 2, 3, 4, 6, 7, and 9 ending just after declivity; sutural, 5, 8, and 10 extending subapically; stria 11 merging with stria 10 at metafemoral emargination; humeral angles broadly obtuse; epipleura deeply excavated at base for reception of mesoleg, form continuous with pronotal epipleura; epipleura narrowing and ending at distal end of excavation; elytra with inflexed lobe immediately distad from excavation, elytron excavated shallowly for reception of metaleg; excavation gently curving, margin then straight to apex; entire margin finely beaded; apex extended, slightly reflexed, angles narrowly obtuse, adjacent; sutural margin finely beaded.

Prosternum Y-shaped; densely, deeply punctate; margins beaded; front margin broadly and evenly emarginate; lateral margins broadly and sinuately emarginate; prosternal process obtusely rounded apically; moderately clothed with short pale bristles.

Proepisternum obsolete. Proepimeron obsolete.

Protrochantin small, triangular, tectiform.

Procoxae transverse, excavated for reception of femora; posterior surface of coxa with a punctate plate-like process covering retracted trochanter.

Trochanter one-quarter length of femora, triangular, with basal spur.

Femora stout, extending to pronotal margin, flattened, modified for complete retraction, punctate, with pale bristles.

Tibia subequal in length to femora, flattened, only slightly narrower than femora, moderately pubescent with short scale-like setae, more sparsely with bristles; apical spurs paired, subequal, minute.

Tarsus one-half length of tibia; four segmented; retractile into tibial grooves; claws simple.

Mesosternum deeply excavated medially for reception of prosternal process, visible portion very narrow, subcarinate laterally, 3 times wider than long, front portion deeply depressed, excavated for reception of procoxae, exposed portion densely and deeply punctate.

Mesoepisternum elongate, triangular. Mesoepimeron elongate, pentagonal.

Mesotrochantin quadrate. Mesocoxae subglobose; anterior surface of coxa forming a small, punctate plate. Mesotrochanter short, triangular, not spurred. Mesofemora similar to profemora. Mesotibia similar to protibia. Mesotarsus similar to protarsus.

Metasternum broad, 3 times wider than long, subequal in length to abdomen; anterior intercoxal process one-third as wide as full sternum, broadly, shallowly, evenly emarginate; anterior quadrants deeply excavated for reception of mesolegs; margins of excavations carinate; lateral margins linear, subparallel; posterior margin straight except for a small intercoxal process; median longitudinal dark line extending from tip of posterior intercoxal process to about two-thirds length of sternum, shallowly and narrowly impressed; sternum medially, latitudinally depressed; moderately to densely, deeply punctate; clothed sparsely with pale bristles.

Metepisternum elongate, deflexed; visible portion anterior, triangular, slightly excavated for mesolegs; covered portion triangular, elongate, narrow.

Metepimeron membranous, narrow, elongate, quadrate.

Metatrochantin obsolete externally.

Metacoxae approximate, extending to elytral margin; plate-like; strongly sinuate posteriorly, widest mesally; moderately, deeply punctate; deeply internally excavated for reception of femora.

Metafemora extending to elytral margin, fitting into shallow emargination; otherwise similar to preceding femora.

Metatibia subequal in length to femora; similar to preceding tibiae.

Metatarsus similar to preceding tarsi.

Abdomen five-sevenths as wide as long; moderately to densely punctate; sparsely bristled; sternite 1 deeply excavated laterally for reception of metalegs; intercoxal process rounded, convex, margins beaded; sternite 2 convex; sternite 3 slightly convex; sternite 4 flattened; sternite 5 convex medially, broadly rounded apically; sternite length ratio 3:2:1:1:3. Entire venter finely microreticulate.

Genitalia as in Figs. 6 and 7; pars basalis convex dorsally, concave ventrally; parameres obsolete; median lobe slightly flattened, spatulate apically.

Female.—Similar to male; abdomen very slightly broader; antennal scape and segment 2 slightly broader, more flattened; genitalia as in Fig. 5; coxites lightly sclerotized, large, stout, sparsely setaceous; stylus small, peg-like, apically setaceous.

Little overall variation, other than size, is apparent in the type series.

Etymology.—I take great pleasure in dedicating this unique, enigmatic moss beetle to the honor of Kenneth W. Cooper; for many years of devotion to studying bryophagous insects.

Holotype male, allotype female, and one-half of the paratype series will be returned to the University of California, Davis. Labelling for the holotype, allotype and most paratypes (58) reads: Sequoia National Park, California; altitude 2000–3000 ft.; V-12-1937; A. T. McClay. Additional paratype data as follows: same data, VI-13-1929 (2), VI-2-1929 (1); Sequoia National Park, California, Ash, Mt. Forebay, IV-25-1949, R. C. Bechtel (10); same data, Ash Mt. R., IV-21-1950 (2) and IV-28-1950 (1). Paratypes will be deposited in the collections of the author; K. W. Cooper, Riverside; L. K. Russell, Corvallis; Oregon State University, Corvallis; U.S. National Museum, Washington, D.C.; California Academy of Sciences, San Francisco; Canadian National Collection of Arthropods, Ottawa; British Museum (Natural History), London; Australian National Insect Collection, Canberra.

At this time, little is known of the exact habitat for this species. R. C. Bechtel (pers. comm.) mentioned that the beetles were collected by sheet-drying debris which had been washed down a flume at the Kaweah Power House no. 3 Reservoir. This flume initiated some distance upstream from the reservoir. *Sierraclava cooperi* is probably a moss feeder as are its nearest relatives, *Curimopsis* spp., and I would suggest that this beetle may be found in mosses growing on boulders, talus, gravel, or mineral soil but receiving enough moisture to keep the microhabitat moist for at least part of the year.

Sierraclava cooperi is taxonomically associated with the byrrhid subfamily Syncalyptinae as arranged by El-Moursy (1969) and Arnett (1973); that is, the genera *Curimopsis* Ganglbauer, *Chaetophora* Kirby et Spence (*Syncalypta* Dillwyn, auct. (Johnson, 1978)), and *Microchaetes* Hope. Within this subfamily, *Sierraclava* is closest to *Curimopsis,* and will key out to this genus in Arnett (1973). The following key modification will allow for quick and easy separation from *Curimopsis* and all other Nearctic byrrhids:

13 (1). Frons with two oblique grooves; integument without scales, but with simple clavate hairs; length 1.0–2.0 mm .... *Chaetophora* Kirby et Spence
Frons without two oblique grooves; integument with decumbent scales or hairs of various forms, and bristle-like hairs of various shapes; length 2.0–3.0 mm 14
14(13). Elytral striae fine, not deeply impressed; punctures fine to moderate, diffuse; bristle-like hairs randomly distributed .... *Curimopsis* Ganglbauer
Elytral striae serially, deeply punctate; bristle-like hairs serial on interstrial spaces .... *Sierraclava,* n. g.

The above character separation of *Sierraclava* from *Curimopsis* is rather obvious and can be easily distinguished even with a low-power handlens in the field. Additionally, differentiating characters separating these two genera include the shorter and more compressed pars basalis, the more spatulate median lobe, the more reduced styli of the female, and the overall convex and elongated form of *Sierraclava*. Opposingly, *Curimopsis* has a longer, subcylindrical, arcuate pars basalis; a narrower median lobe; less reduced female styli; and the overall form is more ovate and dorsally depressed.

Literature Cited

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